What Is Claimed:

1. An optical switch comprising

first and second layers,

a plurality of input channels,

a plurality of output channels at an elevated level relative to the plurality of input channels,

a matrix of deflection nodes on the first layer to deflect incoming incident beams travelling in a first direction from the plurality of input channels in a second direction toward the second layer, and

a plurality of deflection elements on the second layer to deflect the beams in a third direction through free space toward the plurality of output channels.

2. The switch of claim 1, wherein the first layer comprises a plurality of Faraday rotator bars interlaced with a plurality of vertical beam splitter bars in parallel orientation along axes that are parallel to output axes of the plurality of output channels.

3. The switch of claim 2, further comprising an array of electrodes deposited on the plurality of Faraday bars to form a matrix of electro-optic or electro magneto optical

rotator elements each having a first mode in which the beams freely pass therethrough and a second mode in which the beams are phase shifted 90-degrees.

4. The switch of claim 1, wherein the deflection elements on the second layer comprise a plurality of passive mirrors.

5. The switch of claim 4, wherein the plurality of passive mirrors are positioned along a plurality of stepped surfaces on the underside of the second layer.

6. The switch of claim 5, wherein the plurality of stepped surfaces are sloped at a 45-degree angle.

7. The switch of claim 1, wherein each input channel comprises an input fiber and a collimation lens aligned along an input axis

8. The switch of claim 7, wherein the input fiber and collimation lens are held within a V groove formed in an input block of a switch base.

9. The switch of claim 8, further comprising a linear polarizer positioned adjacent to and extending along the length of the input block.

10. The switch of claim 9, wherein each of the plurality of output channels comprises an output fiber held and aligned along an output axis within a V groove formed in an ouput block of the switch base.

11. The switch of claim 10, further comprising a plurality of focus lenses aligned along the output axes of the plurality of output channels.

12. An optical switch comprising

a first layer having a plurality of input wave guide channels extending in parallel orientation along input axes,

a second layer comprising a plurality of output wave guides, each output wave guide comprising a collection channel, a plurality of transition channels, and a plurality of ramps connecting the plurality of transition channels with the collection channel, the collection channel of each of the plurality of output wave guides extending in parallel orientation along output axes, the plurality of transition channels extending from the collection channel along the input axes in parallel orientation with the plurality of input wave guide channels, and

a coupling matrix layer interposing each of the plurality of transition channels and the plurality of input wave guide channels forming a matrix of transition nodes.

13. The switch of claim 12, wherein the coupling matrix layer at each transition node comprises an electro-optical material.

14. The switch of claim 13, further comprising a pair of electrodes connected to opposing sides of the coupling matrix layer at each transition node.

15. The switch of claim 14, wherein the refractive index of the coupling matrix layer is less than the refractive index of each of the plurality of input wave guide channels and transition channels when no electric field is applied and increases when an electric field is applied allowing vertical coupling of an incident beam migrating through an input wave guide channel to a transition channel.

16. An optical switch comprising

first and second identical functional plates comprising a matrix of transmissive blocks having stationary inclined reflective surfaces, the second plate being positioned above and appropriately shifted to orthoganally align the reflective surfaces of the first and second plates,

a plurality of input fibers aligned along input axes and optically coupled to the reflective surfaces of the first plate, and

a plurality of output fibers positioned at an elevated level relative to the plurality of input fibers and aligned along output axes that are orthoganal to the input axes, the plurality of output fibers being optically coupled to the reflective surfaces of the second plate.

17. The switch of claim 16, wherein the reflective surfaces of the first and second plates comprise an electro-optical material.

18. The switch of claim 16, wherein the reflective surfaces comprise a multi layer electro-optical reflective device.

19. The switch of claim 16, further comprising an intermediate layer sandwiched between the first and second plates.

20. The switch of claim 19, wherein the intermediate layer comprises an array of filter cells or coupling matrix cells.